ZooKeys 1195: 239–247 (2024)
DOI: 10.3897/zookeys.1195.117666

Research Article

Two new species of *Orchestina* Simon, 1882 (Araneae, Oonopidae) from Cangshan Mountain, Yunnan, China

Xiaohan Wang[1*], Dongju Bian[2*], Yanfeng Tong[1], Zizhong Yang[3]

1 College of Life Science, Shenyang Normal University, Shenyang 110034, Liaoning, China
2 Key Laboratory of Forest Ecology and Management, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110016, China
3 National-Local Joint Engineering Research Center of Entomoceutics, Dali University, Yunnan Dali 671000, China
Corresponding authors: Yanfeng Tong (tyf68@hotmail.com); Zizhong Yang (yangzzh69@163.com)

Abstract

Two new species of *Orchestina*, *O. dapojing* Tong & Yang, **sp. nov.** (♂♀) and *O. hyperofrontata* Tong & Yang, **sp. nov.** (♂) are described from Yunnan, China. Descriptions, diagnoses and photographs of habitus and copulatory organs are provided.

Key words: Asia, goblin spiders, morphology, Orchestininae, taxonomy

OPEN ACCESS

Academic editor: Yuri Marusik
Received: 21 December 2023
Accepted: 26 February 2024
Published: 15 March 2024

ZooBank: https://zoobank.org/76C90A02-9283-4B45-A007-D206459A4A1A

Citation: Wang X, Bian D, Tong Y, Yang Z (2024) Two new species of *Orchestina* Simon, 1882 (Araneae, Oonopidae) from Cangshan Mountain, Yunnan, China. ZooKeys 1195: 239–247. https://doi.org/10.3897/zookeys.1195.117666

Copyright: © Xiaohan Wang et al.
This is an open access article distributed under terms of the Creative Commons Attribution License (Attribution 4.0 International – CC BY 4.0).

Introduction

Orchestina Simon, 1882 is a species-rich genus of oonopid spider that currently contains 164 extant species (WSC 2024). It has an almost global distribution and occurs in the Northern Hemisphere in the region south of 45°N (Marusik et al. 2018). Currently, 19 species of this genus are known to occur in China (Tong and Li 2011; Liu et al. 2016, 2019; Wang et al. 2021; Lin et al. 2024; Song et al. 2024). Only two species, *O. manicata* Simon, 1893 and *O. striata* Simon, 1909, are known in adjacent Vietnam (WSC 2024).

Although the genus *Orchestina* was well known among arachnologists, there are no global revisions for this genus up to now. The most recent regional revisions on the genus include a description of 18 new species of the Afrotropical region (Henrard and Jocqué 2012) and 85 new species and six known species from the Americas (Izquierdo and Ramírez 2017). Phylogenetic relationships of the species were explored for African species, and two species groups (each with two subgroups) were recognized (Henrard and Jocqué 2012). Species groupings for East Asian or Chinese species have yet to be recognized.

While studying oonopid spiders collected from Cangshan Mountain, Yunnan Province, two new species of the genus *Orchestina* were recognized. It is the first time that this genus has been found in Yunnan. The present paper aims to provide detailed descriptions and illustrations of the two new species, *O. dapojing* Tong & Yang, sp. nov. and *O. hyperofrontata* Tong & Yang, sp. nov.

* These authors contributed equally to this work.

Material and methods

All the specimens used in this study were collected by pitfall trapping and later examined using a Leica M205C stereomicroscope. Details of body parts and measurements were studied under an Olympus BX51 compound microscope. Photos were made with a Canon EOS 750D zoom digital camera (18 megapixels) mounted on the Olympus compound microscope. Endogyne were cleared in lactic acid. All measurements in the text are expressed in millimeters. Terminology and taxonomic descriptions follow Henrard and Jocqué (2012) and Tong and Li (2011). All materials studied are deposited at Shenyang Normal University (**SYNU**) in Shenyang, China.

The following abbreviations are used in the text and figures: **ALE** = anterior lateral eyes; **AUS** = anterior uterine sclerite; **Ex** = dorsolateral extension; **PLE** = posterior lateral eyes; **PME** = posterior median eyes.

Taxonomy

Family Oonopidae Simon, 1890

Genus *Orchestina* Simon, 1882

Type species. *Schoenobates pavesii* Simon, 1873.

Remark. *Orchestina* is considered a senior synonym of *Ferchestina* Saaristo & Marusik, 2004 (type *F. storozhenkoi* Saaristo & Marusik, 2004) by Platnick et al. (2012: 37).

***Orchestina dapojing* Tong & Yang, sp. nov.**
https://zoobank.org/B0FF2F6A-2D30-41B5-A664-902C7BD87328
Figs 1–3

Type material. ***Holotype*** ♂ (SYNU-764): China, Yunnan Prov., Dali Bai Autonomous Pref., Dali City, Cangshan Mt., Dapojing, pitfall trapping in forest, 25°34'17"N, 100°08'15"E, 2600 m, Z. Yang leg., 25/1/2010; ***Paratypes*** 1 ♀ (SYNU-765), same data as holotype; 1 ♂ (SYNU-766), Cangshan Mt., Jishejing, pitfall trapping in forest, 25°40'29"N, 100°06'36"E, 2600 m, Z. Yang leg., 15/11/2008.

Diagnosis. The new species is similar to *O. apiculata* Liu, Xiao & Xu, 2016 in the shape of the bulb and the long psembolus, but can be distinguished by the palpal tibia narrower than the bulb (Fig. 2A) vs. distinctly wider than the bulb in *O. apiculata* (Liu et al. 2016: fig. 2A, B), triangular labium (Fig. 2D) vs. sub-circular (Liu et al. 2016: figs 1E, 3H), and the tubular anterior uterine sclerite (AUS) (Fig. 3G, H) vs. broad and column-shaped (Liu et al. 2016: fig. 2C, D).

Description. Male (holotype). *Body*: habitus as in Fig. 1A, C, E; body length 1.33. ***Carapace*** (Fig. 1B): 0.74 long, 0.56 wide; yellow, oval in dorsal view, with net-shaped pattern, pars cephalica slightly elevated in lateral view, with rounded posterolateral corners. ***Eyes*** (Fig. 1B, F): well developed, nearly equal-sized; posterior eye row recurved from above. ***Clypeus*** (Fig. 1B, F): margin unmodified, curved downwards in front view, sloping forward in lateral view, high, ALE

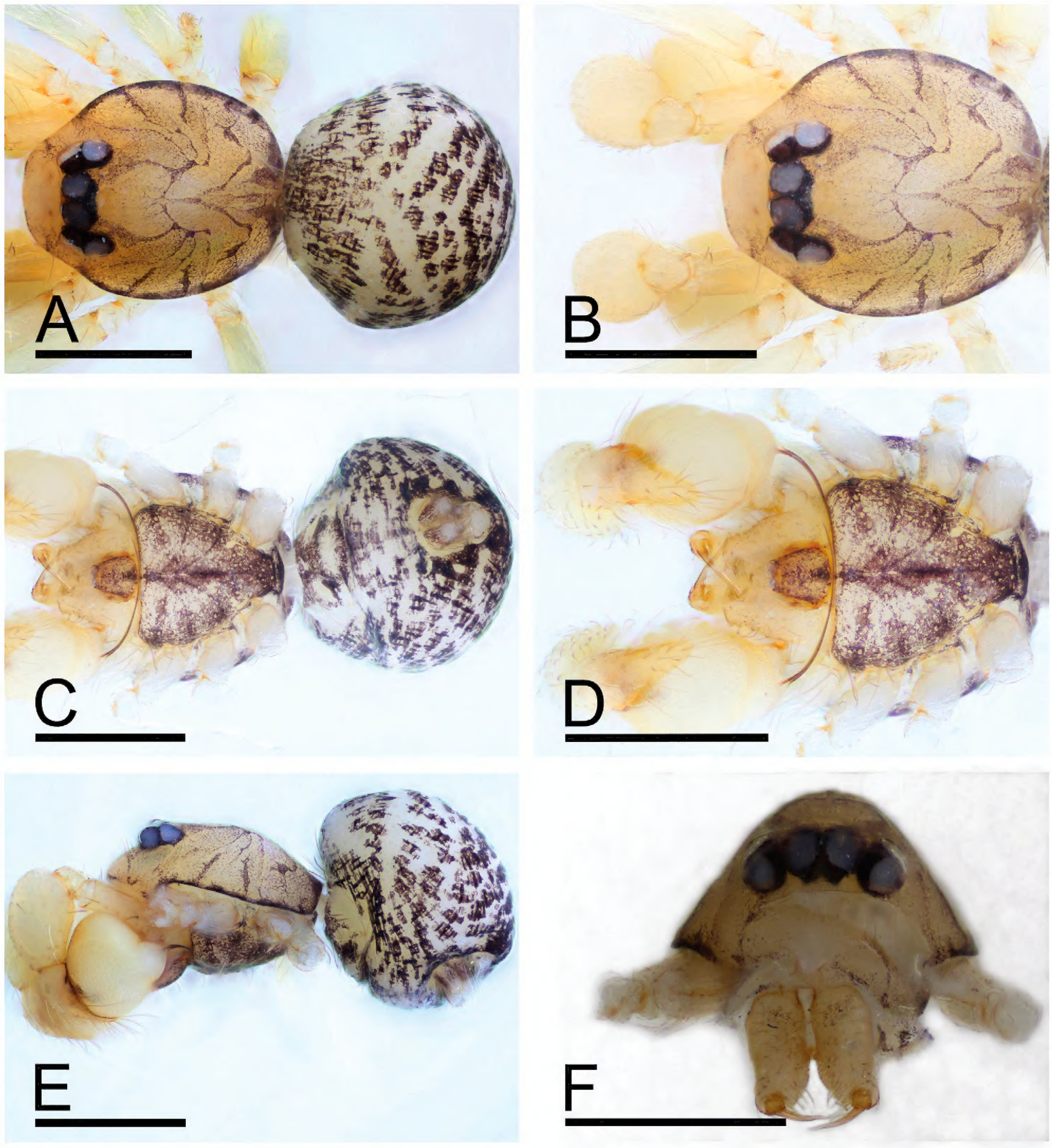

Figure 1. *Orchestina dapojing* sp. nov., male holotype **A, C, E** habitus (dorsal, ventral and lateral views) **B, D, F** prosoma (dorsal, ventral and anterior views). Scale bars: 0.4 mm (**A–F**).

separated from edge of carapace by their diameter or more. ***Sternum*** (Fig. 1D): with marginal band and median dark brown patches; setae sparse, needle-like, evenly scattered. ***Mouthparts*** (Figs 1D, F, 2D): chelicerae straight, anterior face unmodified; labium triangular, anterior margin not indented at middle, lateral margins slightly sclerotized, labium pattern darkly spotted but medially delimiting 2 pale, adjacent, oval areas; endites unmodified. ***Abdomen*** (Fig. 1A, C, E): 0.59 long; with gray net-like pattern; pedicel tube short, unmodified. ***Palp*** (Fig. 2A–C): tibia enlarged, length/width ratio = 1.41, more than 2 times as wide

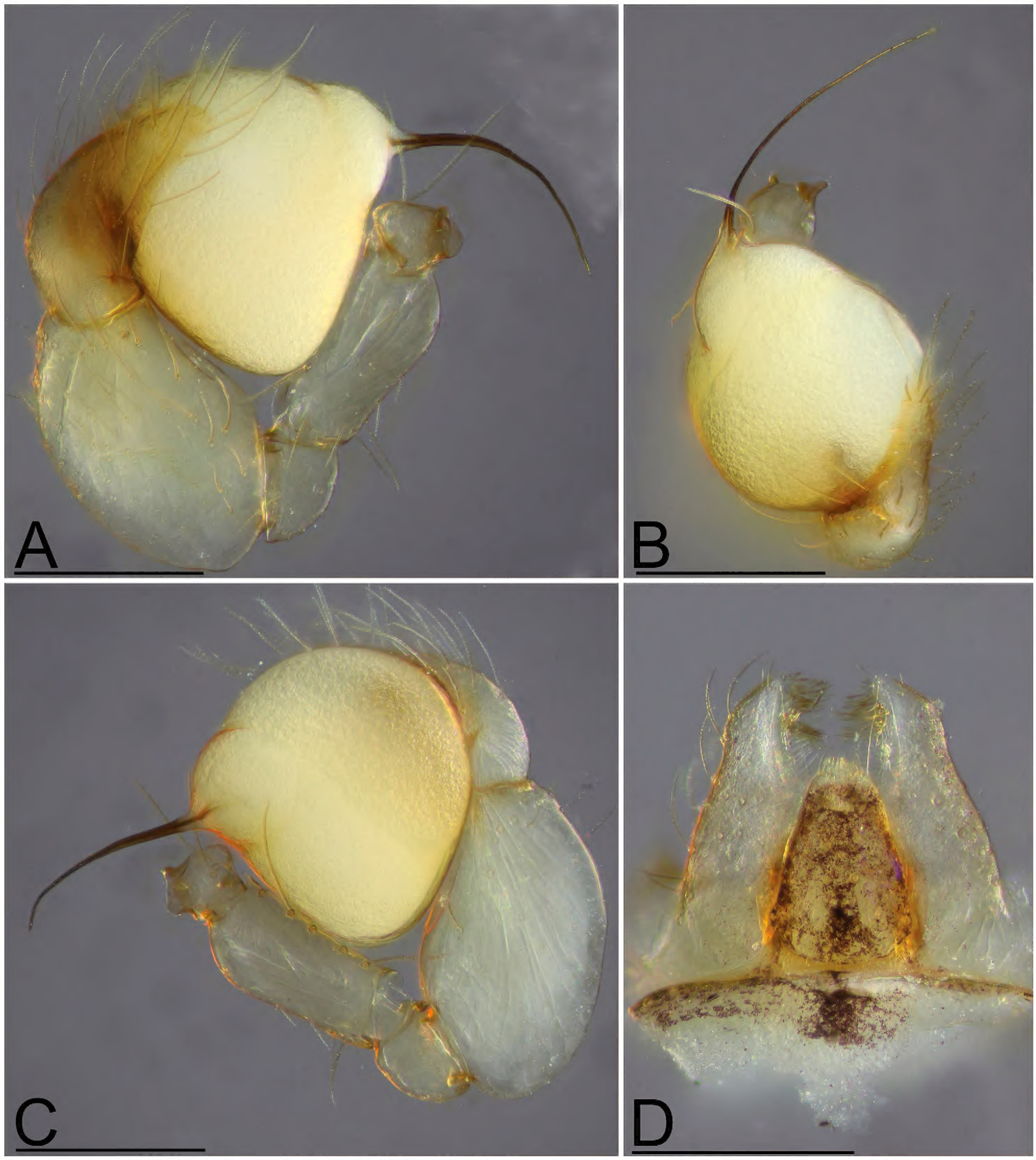

Figure 2. *Orchestina dapojing* sp. nov., male holotype **A–C** left palp (prolateral, dorsal and retrolateral views) **D** endites and labium, ventral view. Scale bars: 0.2 mm (**A–D**).

as femur; bulb pear-shaped, strongly enlarged, about 1.5 times as wide as tibia; psembolus nearly as long as bulb, whip-like, bent inwards.

Female (SYNU-765): Same as male except as noted. Body: habitus as in Fig. 3A, C, E; body length 1.63. ***Carapace*** (Fig. 3B): 0.74 long, 0.57 wide. ***Abdomen*:** 0.89 long. ***Epigaster***: without special external features. ***Endogyne*** (Fig. 3G, H): with medial tubular sclerite (AUS) extending anteriorly, then flipped posteriorly, ending near epigastric furrow; dorsolateral extension (Ex) interrupted anteriorly.

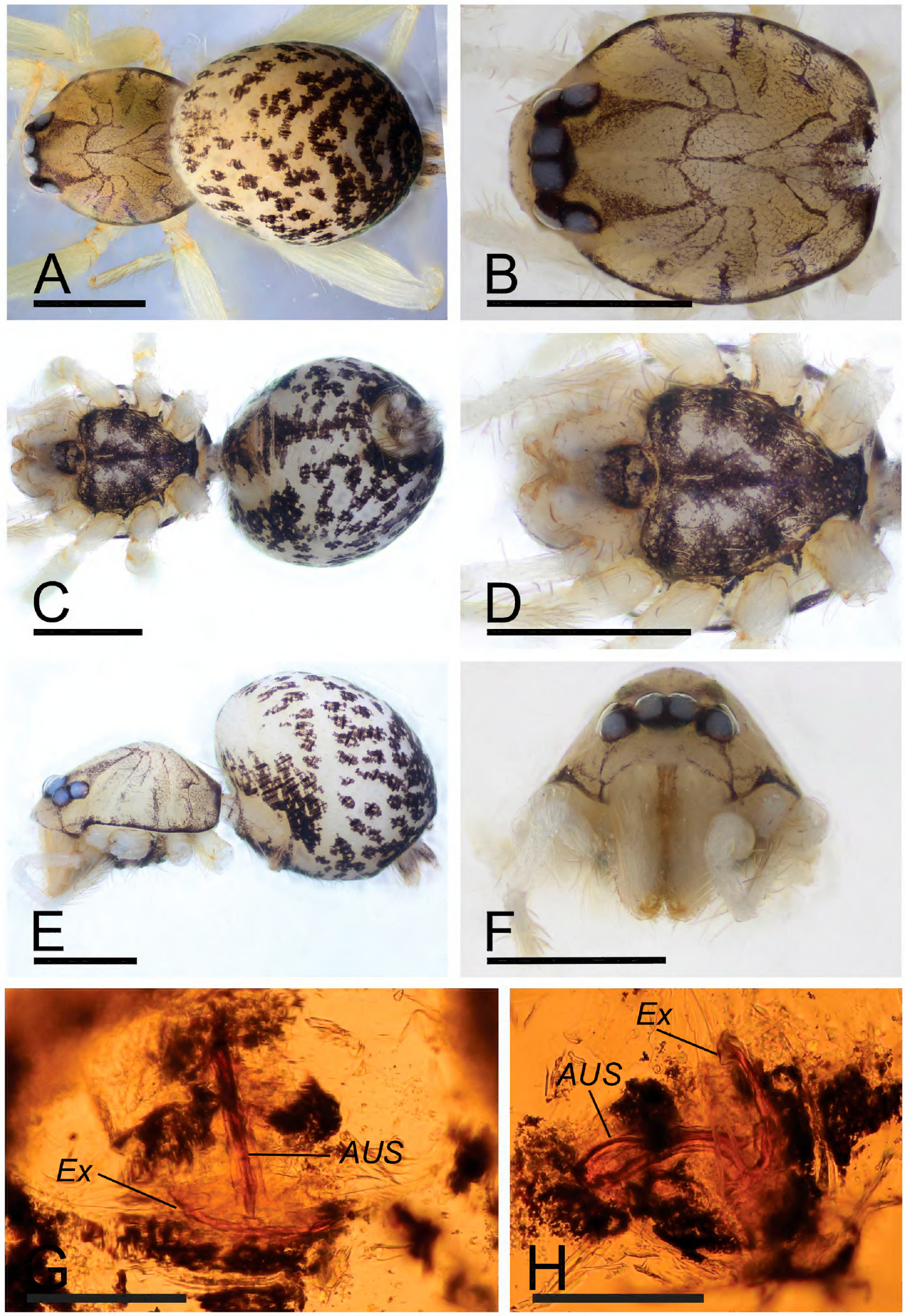

Figure 3. *Orchestina dapojing* sp. nov., female paratype **A, C, E** habitus (dorsal, ventral and lateral views) **B, D, F** prosoma (dorsal, ventral and anterior views) **G** endogyne, dorsal view **H** endogyne, lateral view. Abbreviations: AUS = anterior uterine sclerite; Ex = dorsolateral extension. Scale bars: 0.4 mm (**A–F**); 0.1 mm (**G, H**).

Affinities. The new species is similar to *O. apiculata* and *O. clavigera* Henrard & Jocqué, 2012 (from Kenya). Based on the long, whip-like psembolus, the tubular anterior uterine sclerite (AUS), and the weakly sclerotized endites, the new species should be classified in the *macrofoliata*-subgroup of the *macrofoliata*-group of Henrard and Jocqué (2012).

Etymology. The specific name is a noun in apposition taken from the type locality.

Distribution. Known only from the type locality, Yunnan Province, China.

Orchestina hyperofrontata **Tong & Yang, sp. nov.**
https://zoobank.org/C9704B06-8A4A-4647-9EF2-ED532C9D2271
Figs 4, 5

Type material. ***Holotype*** ♂ (SYNU-762): China, Yunnan Prov., Dali Bai Autonomous Pref., Dali City, Cangshan Mt., Jishejing, pitfall trapping in forest, 25°40'29"N, 100°06'36"E, 2600 m, Z. Yang leg., 15/11/2008; ***Paratype*****:** 1 ♂ (SYNU-763), Cangshan Mt., post-fire forest in 1999, pitfall trapping, 25°38'30"N, 100°08'04"E, S. Huang & Y. Zhang leg., 25/4/2009.

Diagnosis. The new species can be distinguished from all other congeneric species by the strongly elevated clypeus (Fig. 4A, B, E, F) and the prong on the distal part of the chelicerae (Fig. 5F), vs. lacking in congeners.

Description. Male (holotype). ***Body*****:** habitus as in Fig. 4A, C, E; body length 1.31. ***Carapace*** (Fig. 4B, E): 0.74 long, 0.61 wide; yellow, oval in dorsal view; pars cephalica strongly sloped in lateral view, with rounded posterolateral corners. ***Eyes*** (Fig. 4B): well developed, nearly equal-sized; posterior eye row straight from above; ALE far away from PME. ***Clypeus*** (Fig. 4B, E, F): strongly elevated, curved downwards in front view, sloping forward in lateral view, dorso-apically with hum elevating beyond eyes and provided with dense group of pores. ***Sternum*** (Fig. 4D): with brown patches, anteriorly with a thin median sclerotized bar connected to the labium base (Y-shaped pattern in Fig. 5D). ***Mouthparts*** (Figs 4D, 5D–H): chelicerae basally with small conical boss and distally with well-developed prong partially covering base of fang; labium rounded, lateral and basal margins sclerotized, anterior margin not indented at middle; endites unsclerotized, without serrula. ***Abdomen*** (Fig. 4A, C, E): 0.57 long; with gray net-shaped pattern; pedicel tube short, unmodified. ***Palp*** (Fig. 5A–C): tibia enlarged, length/width ratio = 1.65, about 2 times as wide as femur; bulb globose, about 1.5 times as wide as palpal tibia, seminal duct slightly curved and partly visible through cuticle; psembolus about as long as 1/2 bulb, gradually narrowed.

Female. Unknown.

Affinities. The new species *O. hyperofrontata* sp. nov. is similar to *O. utahana* Chamberlin & Ivie, 1935 and *O. obscura* Chamberlin & Ivie, 1942 from the Nearctic in the general shape of the male palp and the presence of prongs on cheliceral promargin (Fig. 5A–C, F; Izquierdo and Ramírez 2017: figs 5B, 15A–C, G–I). Meanwhile, the new species is also similar to *O. kasuku* Henrard & Jocqué, 2012 (from West Africa) in the eye pattern (ALE and PLE not touching

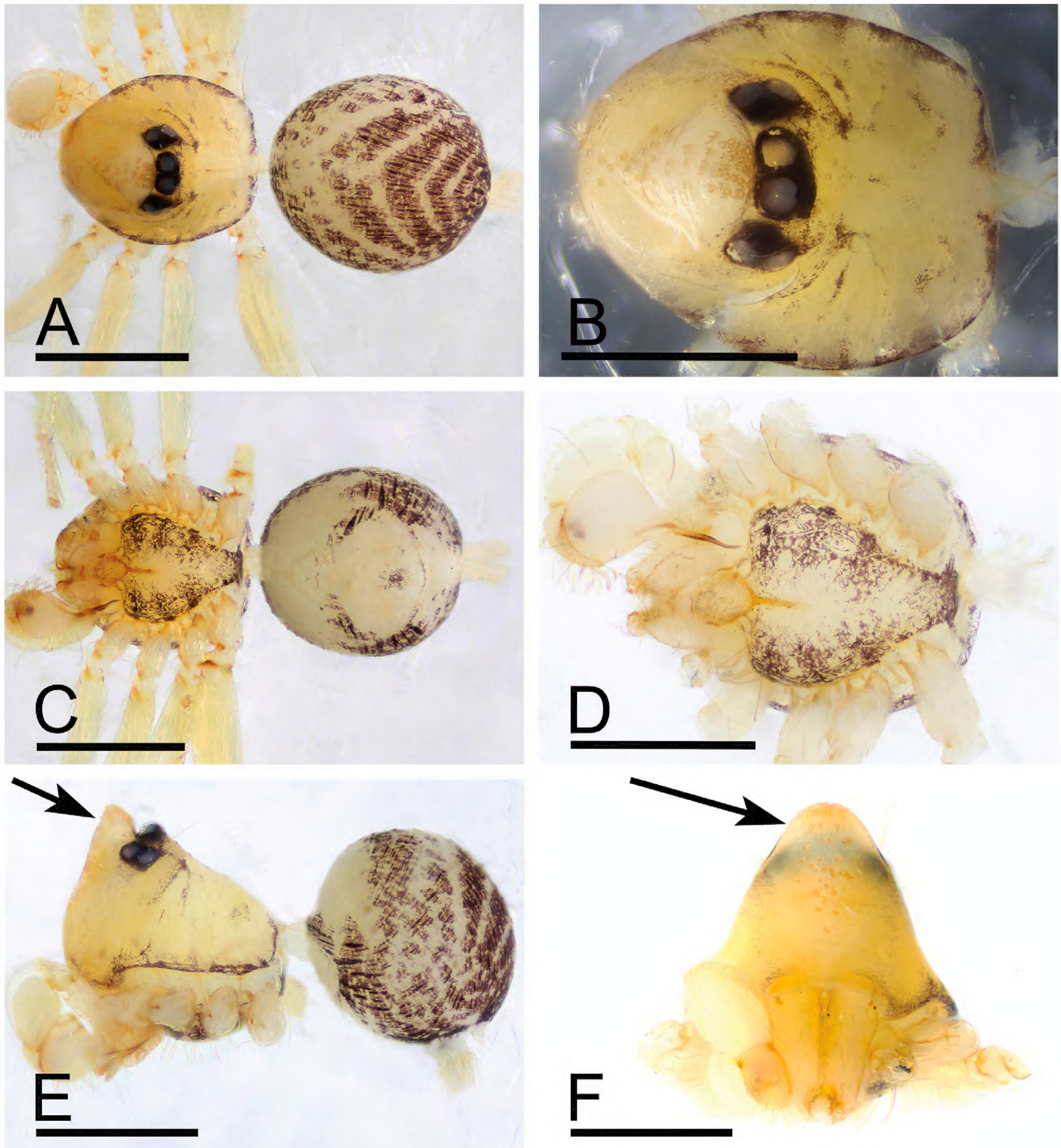

Figure 4. *Orchestina hyperofrontata* sp. nov., male holotype **A, C, E** habitus (dorsal, ventral and lateral views) **B, D, F** prosoma (dorsal, ventral and anterior views), arrows show strongly elevated clypeus. Scale bars: 0.4 mm (**A–F**).

PME), the endites without serrula, and the shape of the bulb (Figs 4B, 5A–D; Henrard and Jocqué 2012: figs 378–416). It is reasonable to place the new species *O. hyperofrontata* sp. nov. in the *macrofoliata*-subgroup of the *macrofoliata*-group of Henrard and Jocqué (2012).

Etymology. The specific name is derived from the Greek, *hypero*, meaning beyond, combined with frons, referring to the strongly elevated clypeus.

Distribution. Known only from the type locality, Yunnan Province, China.

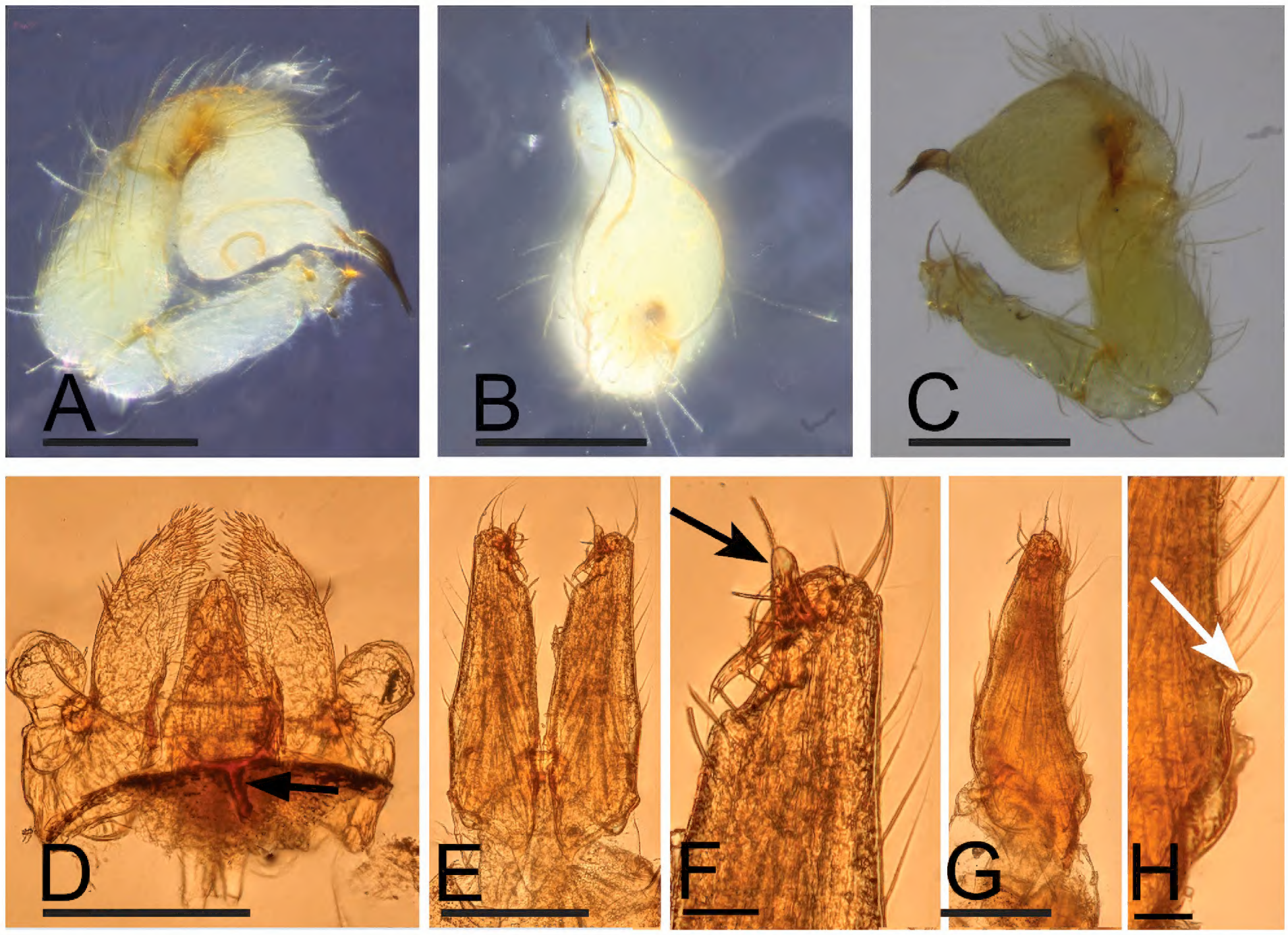

Figure 5. *Orchestina hyperofrontata* sp. nov., male holotype **A–C** left palp (prolateral, dorsal and retrolateral views) **D** endites and labium, ventral view, black arrow shows the Y-shaped sclerotized pattern **E, F** chelicerae, anterior view, black arrow shows the prong **G, H** chelicerae, lateral view, white arrow shows small boss. Scale bars: 0.1 mm (**A–H**).

Acknowledgements

The manuscript benefitted greatly from comments by Arnaud Henrard (Tervuren, Belgium), Yuri M. Marusik (Magadan, Russia) and one anonymous referee. Christopher J. Glasby kindly checked the English of an early draft.

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Funding

This study was supported by the National Natural Science Foundation of China (NSFC-31060070, 31972867, 32370479).

Author contributions

Conceptualization: YT. Resources: YT, ZY. Writing – original draft: XW, DB. Writing – review and editing: YT, ZY.

Author ORCIDs

Xiaohan Wang https://orcid.org/0009-0000-4614-9562
Dongju Bian https://orcid.org/0000-0002-9324-8026
Yanfeng Tong https://orcid.org/0000-0002-4348-7029
Zizhong Yang https://orcid.org/0000-0002-2143-8226

Data availability

All of the data that support the findings of this study are available in the main text.

References

Henrard A, Jocqué R (2012) An overview of Afrotropical canopy-dwelling *Orchestina* (Araneae, Oonopidae), with a wealth of remarkable sexual dimorphic characters. Zootaxa 3284(1): 1–104. https://doi.org/10.11646/zootaxa.3284.1.1

Izquierdo MA, Ramírez MJ (2017) Taxonomic revision of the jumping goblin spiders of the genus *Orchestina* Simon, 1882, in the Americas (Araneae: Oonopidae). Bulletin of the American Museum of Natural History 410: 1–362. https://doi.org/10.1206/0003-0090-410.1.1

Lin Y, Li S, Mo H, Wang X (2024) Thirty-eight spider species (Arachnida: Araneae) from China, Indonesia, Japan and Vietnam. Zoological Systematics 49(1): 4–98.

Liu K, Xiao Y, Xu X (2016) On three new *Orchestina* species (Araneae: Oonopidae) described from China. Zootaxa 4121(4): 431–446. https://doi.org/10.11646/zootaxa.4121.4.4

Liu K, Henrard A, Xiao Y, Xu X (2019) On three new oonopid species from China and the discovery of the male *Orchestina bialata* Liu, Xiao & Xu, 2016 (Araneae: Oonopidae). Zootaxa 4701(3): 235–256. https://doi.org/10.11646/zootaxa.4701.3.2

Marusik YM, Perkovsky EE, Eskov KY (2018) First records of spiders (Arachnida: Aranei) from Sakhalinian amber with description of a new species of the genus *Orchestina* Simon, 1890. Far Eastern Entomologist = Dal'nevostochnyi Entomolog 367: 1–9. https://doi.org/10.25221/fee.367.1

Platnick NI, Abrahim N, Álvarez-Padilla F, Andriamalala D, Baehr BC, Baert L, Bonaldo AB, Brescovit AD, Chousou-Polydouri N, Dupérré N, Eichenberger B, Fannes W, Gaublomme E, Gillespie R, Grismado CJ, Griswold CE, Harvey MS, Henrard A, Hormiga G, Izquierdo MA, Jocqué R, Kranz-Baltensperger Y, Kropf C, Ott R, Ramírez MJ, Raven RJ, Rheims CA, Ruiz GRS, Santos AJ, Saucedo A, Sierwald P, Szűts T, Ubick D, Wang XP (2012) Tarsal organ morphology and the phylogeny of goblin spiders (Araneae, Oonopidae), with notes on basal genera. American Museum Novitates 3736: 1–52. https://doi.org/10.1206/3736.2

Song C, Tong Y, Bian D, Li S (2024) A survey of the genus *Orchestina* Simon, 1882 (Araneae, Oonopidae) from Xishuangbanna, China, with descriptions of five new species. Zoosystematics and Evolution 100(1): 255–277. https://doi.org/10.3897/zse.100.117968

Tong Y, Li S (2011) Six new *Orchestina* species from Hainan Island, China (Araneae, Oonopidae). Zootaxa 3061: 36–52. https://doi.org/10.11646/zootaxa.3061.1.2

Wang Y, Wan N, Tong Y, Marusik YM (2021) On the northernmost *Orchestina* species in China, with a first description of the female of *O. zhiwui* (Araneae, Oonopidae). ZooKeys 1022: 1–11. https://doi.org/10.3897/zookeys.1022.62387

WSC (2024) World Spider Catalog, version 25.0 Natural History Museum Bern. World Spider Catalog. https://doi.org/10.24436/2 [Accessed on 11 February 2024]